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APPENDIX G: SOCIOECONOMIC IMPACTS OF POLLUTION CONTROL SCENARIOS FOR THE CHESAPEAKE BAY WATERSHED

At the request of EPA's Chesapeake Bay Program, EPA National Center for Environmental Economics (NCEE) has evaluated the socioeconomic impact of developing revised water quality criteria, designated uses, and boundaries for the Chesapeake Bay and its tidal waters. The major objective was to estimate the economic impacts of both the direct and indirect effects of compliance. Measures of economic impacts include changes in the value of regional output, or goods produced, employment, as well as wages and income.

Given the size of the regional economy ($1.4 trillion in personal income in 1999 in the 6-State area and the District of Columbia, including $573 billion in Bay counties), net impacts over this area are not likely to be seen. For example, gross regional product in the State of Maryland is forecast to grow by 37% by 2010, corresponding to 19% growth in employment and 17% growth in real disposable personal income (REMI, 2002). The Minnesota Implan Group's (2001) economic impact model indicates that the Tier 3 scenario would result in a net increase in output, employment and value added. The stimulus results from increased spending in high wage industries (e.g., wastewater treatment) as well as an influx of funds for pollution controls (e.g., Federal cost shares for agricultural best management practices); not included are additional market benefits likely to result from improved water quality (e.g., commercial and recreational fishing industries). Therefore, the regional economy should expand as a result of the Tier scenarios.

The estimated annual cost of Tier 3 for 2010 populations ($1.2 billion in 2001 dollars) represents 0.2% of personal income in the Bay counties in 1999. Even if all capital costs ($7.6 billion) for this scenario were incurred in one year, they represent only 1.3% of personal income in the Bay counties in 1999. Although these data indicate that the pollution controls specified in the Tier scenarios will not result in substantial and widespread social and economic hardship, there may be localized areas that need funding priority; special considerations can also be used, under certain circumstances, at the local level.

1.0 INTRODUCTION

1.1 Background

The Chesapeake Bay Program (CBP) is developing revised water quality criteria, designated uses, and boundaries for the bay and its tidal waters, as well as a use attainability analysis (UAA) to support these changes. Among the factors that the CBP is evaluating as part of the UAA is whether the refined designated uses would require pollution controls more stringent than those required under Sections 301(b)(1)(A) and (B) and Section 306 of the Clean Water Act (i.e., nutrient controls) which would result in substantial and widespread social and economic hardship in the Bay watershed. Statutes provide that States may cite substantial and widespread economic impacts of compliance as a reason States may revise the designated uses of a water body.

At the request of EPA's Chesapeake Bay Program (CBP), National Center for Environmental Economics (NCEE) has evaluated the socioeconomic impact of the revised water quality criteria, designated uses, and boundaries for the bay and its tidal waters on the Bay watershed region. Our major objective was to estimate the economic impacts of both the direct and indirect effects of compliance. Measures of economic impacts include changes in the value of regional output, or goods produced, employment, as well as wages and income. These measures are important to determining whether "widespread economic impacts" are present, as defined below and in EPA's Water Quality Standards Handbook (referred to as the "guidance" hereafter).[1]

1.2 What are Significant and Widespread Economic Impacts? [2]

EPA's guidance defines substantial and widespread differently, depending on the type of entity. *For public-sector entities:*

- Substantial impacts include financial impacts on the community, taking into consideration current socioeconomic conditions

- Widespread impacts refers to changes in the community's socioeconomic conditions

For private-sector entities:

- Substantial impacts refer to financial impacts
- Widespread impacts refer to socioeconomic impacts on the surrounding community

In addition the terms financial and socioeconomic are defined:

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[1] Interim Economic Guidance for Water Quality Standards: Workbook. Appendix M of Water Quality Standards Handbook. Second Edition. U.S. Environmental Protection Agency. EPA-823-B-95-002. March, 1995.

[2] The word "and" is significant. From the guidance, pp. 1–8 : "Demonstration of substantial financial impacts is not sufficient reason to modify a use... Rather, the applicant must also demonstrate that compliance would create widespread socioeconomic impacts on the affected community."

- Financial impacts refers to impacts on the entity or party that will pay for pollution control

- Socioeconomic impacts refers to changes in the social and/or economic conditions of the affected community

1.3 Methodology

The guidance specifies three steps to determining whether impacts are expected to be widespread:

- **Step 1:** Define relevant geographic area
- **Step 2:** Estimate socioeconomic changes due to pollution control costs
- **Step 3:** Consider the multiplier effect.

Geographic Area

The analysis must define the affected community (the geographic area where project costs pass through to the local economy), consider the baseline economic health of the community, and finally evaluate how the proposed project will affect the socioeconomic well-being of the community. This analysis treats each state separately: A model was compiled including the counties that include the Chesapeake Bay watershed. For Maryland, this means all counties are included, as is the entire District of Columbia. For other jurisdictions, only a portion of the state is included.

Estimate Socioeconomic Changes

There are no economic ratios per se that evaluate socioeconomic impacts. Instead, the relative magnitude indicators such as increases in unemployment, losses tot he local economy, changes in household income, decreases in tax revenue, indirect effect effects on other businesses, and increases in sewer fees for the remaining private entities should be taken into account when deciding whether impacts could be considered widespread.

Multiplier Effects

The effects of increased unemployment, decreased personal income, and reductions in local expenditures by the entity or group of entities (public and private) will be compounded as money moves through the local economy. Some portion of the lost income would have been spent in the local economy for the purchase of other goods and services and thus for the salaries of other local employees. These local employees, in turn, would have spent some portion of their income in the local economy. This multiplier effect means that each dollar lost to an employee results in the loss of more than one dollar to the local economy.

EPA's guidance mentions the U.S. Commerce Department's RIMS II multipliers as a way of measuring these socioeconomic impacts. There are, however, a number of data products and

commercially available computer models that are equal or better than RIMS II in terms of credibility and theoretical underpinnings, yet offer significant advantages. Implan (Impact Analysis for Planning), produced by the Minnesota Implan Group, Inc.(MIG, 2001), and the Multi-Region Policy Insight models produced by Regional Economics Models, Inc. (REMI) are two such packages. EPA's National Center for Environmental Economics has purchased and maintains the Implan and REMI models and made them available to the CBP for this analysis.

Implan is an input-output model that, without further calibration, can produce State-level multipliers that are directly comparable to RIMS II multipliers. Implan data are compiled from state, local and national sources including:

- U.S. Bureau of Economic Analysis Benchmark I/O Accounts of the United States
- U.S. Bureau of Economic Analysis Output Estimates
- U.S. Bureau of Economic Analysis REIS Program
- U.S. Bureau of Labor Statistics ES202 Program
- U.S. Bureau of Labor Statistics Consumer Expenditure Survey
- U.S. Census Bureau County Business Patterns
- U.S. Census Bureau Decennial Census and Population Surveys
- U.S. Census Bureau Economic Censuses and Surveys
- U.S. Department of Agriculture
- U.S. Geological Survey

The Implan database features:

- 528 Industrial Sectors, typically at the 4-digit Standard Industrial Classification level in manufacturing, 2–3 digit for other sectors

- All states and counties in the United States

- All elements balanced to the National Income and Product Accounts

- Conforms to I/O accounting definitions

- Easily customizable through the IMPLAN software

In addition, NCEE has used the REMI model over a period of several years. REMI incorporates aspects of computable general equilibrium, input-output, and econometric forecasting models into one model that takes advantage of the relative strengths of each method.

The REMI model features:

- 53 sectors

- 51 regions, including all States plus the District of Columbia

- It has a strong theoretical foundation which has been peer reviewed and demonstrated
- Gives forecasts for a large number of output variables including prices and incomes
- Allows users to generate forecasts for any combination of future years, allowing flexibility in analyzing the timing of economic impacts
- It accounts for business cycles, reducing error.

2.0 BASELINE ISSUES

Before analyzing socioeconomic changes associated with compliance costs, it is useful to have a clear forecast of socioeconomic changes expected under baseline, or status quo, conditions. Two processes, in particular, will continue to affect both socioeconomic conditions and water quality. These include Land use changes and economic development, discussed below.

This baseline analysis has only been done at the State level. Because Maryland is the only State with all counties withing the Chesapeake Bay watershed, results are only shown here for the State of Maryland. However, this analysis is potentially informative of the trends that affect all regions in the Chesapeake Bay watershed.

2.1 Land Use

A discussed elsewhere in the UAA, the land use model forecasts that by 2010 in the State of Maryland, there will be 3.4% fewer tillable acres, 13.5% less hay and pasture, 5.0% less forest land, 9.0% more open space and 17.1% more urban area. We can extend these trends slightly by realizing that less hay and pasture probably means a reduction in animal agriculture (this is supported by the 17.6% reduction in excess manure loadings forecasted with the land use model).

Exhibit G-1: Land Use Model Changes

Land Use	1998 Output*	Change*	Output Impact*	Employment
Food Grains	24.42	– 0.83 (3.4%)		
Hay & Pasture	84.87	– 11.46 (13.5%)		
Cattle	43.77	– 5.91 (13.5%)		
Forestry Products	119.89	– 5.99 (5.0%)		
Total		– 24.19	– 36.67	– 787

* millions

These four changes sum to a combined total of $24.19 million and the economic impact of these changes is a loss of $36.67 million in value of economic output and 787 jobs in Maryland.

2.2 Economic Development

Exhibit G-2 shows highlights of the forecast produced by Regional Economic Models, Inc.(REMI) for the state of Maryland through 2020. The first column lists the values for the year 2000. Columns corresponding to other years are given in percent increases or decreases over the year 2000 values.

REMI forecasts that the economy of the state of Maryland will continue to grow. In 2010, the GRP is projected to be 37.1% higher than the GRP in 2000. Employment will continue to grow, although at a slower pace. In 2010, Maryland will have 18.6% more workers. Compared to the rest of the United States, the exhibit shows that in 2000 Maryland employed 1.8% of the nations workers, and by 2010, this percentage is expected to grow by 9.5% (In 2010, MD will have 2.0% of the nations workers). Population, at 5.2 million in 2000, will grow by 15% by 2010. People will be better off, as the exhibit shows that Real Disposable Personal Income (RDPI) will expand by 17.1% by 2010.

The economy in the future will continue to evolve. The last four rows of the exhibit show the employment in various sectors. Manufacturing and Farm employment will decrease by 3.6 and 17.5% respectively, while Non-Manufacturing and Government will continue to expand by 21.5 and 15.3%, respectively by the year 2010. Notice how closely the government employment estimate tracks the population estimate.

Exhibit G-2: Macroeconomic Forecast, 2000–2020, Maryland

Factor	2000	2005	2010	2015	2020
GRP (Billions 1992 $)	158	+18.6 %	+37.1 %	+53.7 %	+69.5 %
Employment (Thousands)	3,106	+10.9 %	+18.6 %	+23.0 %	+26.6 %
– Percent of U.S.	1.8 %	+5.6 %	+9.5 %	+10.1 %	+10.6 %
Population (Thousands)	5,238	+6.8 %	+15.5 %	+23.0 %	+29.4 %
RDPI per cap (Thousands 1992 $)	23.5	+9.2 %	+17.1 %	+22.7 %	+28.7 %
Manufacturing Employment	187,700	–2.4 %	–3.6 %	–2.00 %	+0.00 %
Non-Manufacturing Employment	2,374,000	+12.6%	+21.4 %	+26.0 %	+30.0 %
Government Employment	525,000	+8.8 %	+15.3 %	+19.8 %	+22.7 %
Farm Employment	17,900	–9.8 %	–17.5 %	–21.5 %	–25.4 %

Note also that by 2020, most of those manufacturing jobs have returned, but the farm jobs continue to disappear.

3.0 UAA ECONOMIC IMPACT ANALYSIS BY TIERS OF IMPLEMENTATION

To develop a scenario that would provide meaningful information on the potential economic impact of pollution control scenarios for the Chesapeake Bay watershed, cost information developed elsewhere in this UAA is introduced to the model[3]. **Exhibits G-3** through **G-23** list the IMPLAN model results for each state and tier. The impact results are measured in terms of output, employment and value added.

- ***Output*** means the dollar value of all goods and services produced in the state. Negative (positive) numbers mean reductions (increases) in output, that is declining (increasing) gross regional product.

- ***Employment*** is the total effect on statewide employment, counting all direct and ripple effects.

- ***Value Added*** includes labor income, corporate income and indirect business taxes.

The rows in **Exhibits G-3** to **G-23** represent the sectors affected by specific control measures and are discussed below. The column labeled "Tier X Costs" represents the direct and "ripple" effects of the nutrient and sediment reduction actions. For example, the total jobs figures under the Economic Impact sub-heading in the Tier X Cost column represents the economy-wide employment impact in all sectors.

The column labeled Tier X Spending shows the stimulus effect of program--related spending to implement the nutrient and sediment reduction actions. For example, the total jobs figure under the Economic Impact subheading in the Tier X Spending column represents the number of additional jobs supported. In most instances, this number exceeds the number of jobs lost. However, a couple of caveats apply: First, the model assumes no supply constraints for labor or materials. These total impacts can only be realized if there are, in fact, workers available to take the positions and no other resource constraints are binding. The second caveat is that this is the long-term effect, and some time will be required before the spending impacts are fully realized.

The socioeconomic impacts are modest on net, but there are important distributional consequences. Overall, consumers bear most of the costs through higher taxes (for Agricultural controls) or higher water and sewer fees, or both. Reductions in disposable income tend to concentrate cost impacts on the retail, restaurant, and service sectors. Spending impacts occur in many skilled professional and technical areas such as water treatment, construction, agricultural services. It also should be emphasized that because of the small size of these impacts relative to

[3] Estimates are from the September 25 Draft.

the sectors themselves, the true implications of these impacts are higher or lower growth, not absolute expansion or contraction.

Given the size of the regional economy ($1.4 trillion in personal income in 1999 in the six-State area and the District of Columbia, including $573 billion in Bay counties), impacts over this area are likely to be modest. For example, gross regional product in the State of Maryland is forecast to grow by 37% by 2010, corresponding to 19% growth in employment and 17% growth in real disposable personal income (REMI, 2002). The Minnesota Implan Group's (2001) economic impact model indicates that the Tier 3 scenario would result in a net increase in output and employment over this baseline level of growth. The increased economic benefits result from increased spending in high wage industries (e.g., wastewater treatment) as well as an influx of funds for pollution controls (e.g., Federal cost shares for agricultural best management practices); not included are additional market benefits likely to result from improved water quality (e.g., commercial and recreational fishing industries). Therefore, the regional economy is forecast to be stimulated by the Tier scenarios.

The estimated annual cost of Tier 3 for 2010 populations ($1.2 billion in 2001 dollars) represents 0.2% of personal income in the Bay counties in 1999. Even if all capital costs ($7.6 billion) for this scenario were incurred in one year, they represent only 1.3% of personal income in the Bay counties in 1999. Although these data indicate that the pollution controls specified in the Tier scenarios will not result in substantial and widespread social and economic hardship, there may be localized areas that need funding priority; variances can also be used, under certain circumstances, at the local level.

The following describes in detail the sectors and scenarios that were modeled, and correspond to the estimates shown in Exhibit G-13.

POTWs

POTW face increased cost of treatment, and some of these costs are paid by state and federal funds. We assume 25% of the capital costs are funded by the states, 25% by federal government, and 50% of capital costs, plus all operation and maintenance expense is borne by the entity itself. (Note: the most recent economic screening analyses, Appendix H, calls for a 10% cost share for VA POTWs. This regional impact study will be revised to reflect this and other changes to the final cost and economic analyses by April 2003). For the state and for the POTW itself, we assume revenue neutrality, meaning that costs are passed on to residential customers through higher fees. For the impact model, we model the costs of POTW expansion as a decrease in household consumption equal to the annual operation and maintenance expense plus 75% of the annualized capital cost.

The economic impact of expanding POTWs is modeled by increasing output of the water supply and sewerage systems sector by the full amount of annual operating and maintenance expenditures plus 100% of the annualized capital cost.

Industrial Facilities

Certain industries face increased cost of treatment under the various tiers. This analysis uses EPA data on the firms likely to be affected and the sectors to which they belong, hence the industries represented varies by State. We model the impact of an increase in cost as a decrease in output.[4]

Water pollution abatement control in the affected industries consists mainly of procedures to remove BOD and toxics, not unlike the processes used by a sewage treatment plant. We use the models sewage treatment sector as a template to allocate the treatment costs across input suppliers.

Agriculture

Agriculture will be responsible for a large fraction of the abatement, but we have assumed for this analysis that the agriculture sectors will receive a great deal of cost sharing from state and federal sources. Based on an analysis of the most recent legislative provisions, the distribution of public funds is 68% federal, and 32% state. For the state, we assume revenue neutrality, meaning that costs are passed on to residential customers through higher taxes. We model the impact of increased taxes as a decrease in household consumption equal to the state portion of costs. Private sector (on-farm) costs are modeled as a decrease output of food grains.

The economic impact of expanding agricultural BMPs is modeled by increasing output of agricultural services sector by the full costs, including state and federal portions.

Forestry

The impact of Forestry BMP costs is modeled by decreasing output, and increasing the agricultural and forestry sectors.

Urban

We model economic impact of increasing urban and mixed open land use BMPs similar to POTWs, but without cost sharing. Costs are assumed to be passed on to residents through higher fees (revenue neutrality), who compensate by reducing household expenditures. The expenditures boost the output of the water supply and sewerage systems sector.

[4] This implicitly assumes that these firms sell undifferentiated into a competitive national or world market, which seems reasonable considering the industries represented. This also is a conservative approach. If on the other hand, firms held a regional monopoly, the costs would come out of profits, not output and employment effects would be minimal.

Septic Systems

Many aging septic systems will be upgraded under Tiers 2 and 3, and we model the impact of these expenditures as a decrease in other household expenditures, and in increase in demand for the residential maintenance and repair (skilled labor category including plumbers and licensed contractors).

Exhibit G-3: Economic Impact, Tier 1, Delaware

Source Category	Tier 1 Costs		Tier 1 Spending	
	Economic Effect	Economic Impact	Economic Effect	Economic Impact
Agriculture – private	Reduced Output $258,999	Total Output.....(404,691) Total Jobs.....(5.9) Value Added.....(149,573)	Increased Output: Ag. Services $1,746,153	Total Output.....2,590,252 Total Jobs.....106.3 Value Added.....1,503,932
Agriculture – public	Reduced Household Consumption $475,889	Total Output.....(660,727) Total Jobs.....(8.3) Value Added.....(405,248)		
Urban & Mixed Open	Reduced Household Consumption $477,673	Total Output.....(663,203) Total Jobs.....(8.3) Value Added.....(406,767)	Increase Output: Water Supply & Sewerage $477,673	Total Output.....709,442 Total Jobs..... 5.6 Value Added.....461,631
POTW	Reduced Household Consumption $254,659	Total Output.....(353,570) Total Jobs.....(4.4) Value Added.....(216,857)	Increase Output: Water Supply & Sewerage $254,659	Total Output.....378,221 Total Jobs.....3.0 Value Added.....246,107
Forest	Reduced Output $14,685	Total Output.....(17,594) Total Jobs.....(0) Value Added.....(5,613)	Increase Output: Ag. Services $14,685	Total Output.....21,784 Total Jobs .....1 Value Added.....12,648
Total	**Cost $1,481,905**	**Total Output.....(2,099,785) Total Jobs.....(26.9) Value Added.....(1,184,058)**	**Spending $2,493,170**	**Total Output.....3,699,699 Total Jobs .....115.9 Value Added.....2,224,318**

Notes: Amounts are based on analysis dated September 25, 2002

Exhibit G-4: Economic Impact, Tier 1, District of Columbia

Source Category	Tier 1 Costs		Tier 1 Spending	
	Economic Effect	Economic Impact	Economic Effect	Economic Impact
Urban & Mixed Open	Reduce Household Consumption Cost: $332,743	Total Output.....($386,443) Total Jobs.....(2.6) Value Added.....($167,711)	Increase Output: Water Supply & Sewerage $332,743	Total Output.....$494,191 Total Jobs.....$3.9 Value Added.....$321,568
Total	**Cost: $332,743**	**Total Output.....($386,443) Total Jobs.....(2.6) Value Added.....($167,711)**	**Spending $332,743**	**Total Output.....$494,191 Total Jobs.....$3.9 Value Added.....$321,568**

Notes: Amounts are based on analysis dated September 25, 2002

Exhibit G-5: Economic Impact, Tier 1, Maryland

Source Category	Tier 1 Costs		Tier 1 Spending	
	Economic Effect	Economic Impact	Economic Effect	Economic Impact
Urban & Mixed Open	Reduce Household Consumption $24,083,796	Total Output...($32,696,230) Total Jobs.....(327.7) Value Added..($15,865,513)	Increase Output: Water Supply & Sewerage $24,083,796	Total Output.....$38,474,802 Total Jobs.....313.5 Value Added.....$25,135,277
POTW	Reduce Household Consumption $65,400,564	Total Output...($88,787,991) Total Jobs.....(890.0) Value Added..($43,083,468)	Increase Output: Water Supply & Sewerage $71,397,220	Total Output....$114,059,830 Total Jobs.....929.4 Value Added.....$74,514,369
Agriculture – private	Reduce Output $591,127	Total Output.....($981,803) Total Jobs.....(15.7) Value Added.....($394,308)	Increase Output: Ag. Services $8,427,054	Total Output.....$13,213,357 Total Jobs.....474.3 Value Added.....$7,987,079
Agriculture – public	Reduce Household Consumption $2,613,778	Total Output.....($3,548,473) Total Jobs.....(35.6) Value Added....($1,721,860)		
Forest	Reduce Output $1,592,527	Total Output.....($2,249,093) Total Jobs.....(30.4) Value Added.....($866,003)	Increase Output: Ag. Services $1,592,527	Total Output.....$2,497,033 Total Jobs.....89.6 Value Added.....$1,509,381
Total	**Cost $94,281,792**	**TotalOutput($128,263,590) Total Jobs.....(1,299.4) Value Added.($61,931,152)**	**Spending $105,500,597**	**Total Output..$168,245,022 Total Jobs.....1,806.8 Value Added..$109,146,106**

Notes: Amounts are based on analysis dated September 25, 2002

Exhibit G-6: Economic Impact, Tier 1, New York

Source Category	Tier 1 Costs		Tier 1 Spending	
	Economic Effect	Economic Impact	Economic Effect	Economic Impact
Agriculture – private	Reduce Output Cost: $491,510	Total Output.....($787,305) Total Jobs.....(13.1) Value Added.....($275,033)	Increase Output: Ag. Services $1,283,315	Total Output.....$2,017,545 Total Jobs.....60.6 Value Added.....$1,134,352
Agriculture – public	Reduce Household Consumption Cost: $253,378	Total Output.....($380,405) Total Jobs.....(4.9) Value Added.....($226,576)		
Urban & Mixed Open	Reduce Household Consumption Cost: $1,633,853	Total Output.....($2,452,958) Total Jobs.....(31.4) Value Added....($1,461,023)	Increase Output: Water Supply & Sewerage $1,633,853	Total Output.....$2,046,072 Total Jobs.....17.7 Value Added.....$1,321,941
Forest	Reduce Output Cost: $3,635,376	Total Output.....($5,257,087) Total Jobs.....(77.8) Value Added....($1,936,036)	Increase Output: Ag. Services $3,653,376	Total Output.....$5,715,303 Total Jobs.....171.5 Value Added.....$3,213,392
Total	**Cost $6,014,117**	**Total Output...($8,877,755) Total Jobs.....(127.2) Value Added...($3,898,668)**	**Spending $6,552,544**	**Total Output.....$9,778,920 Total Jobs.....250 Value Added.....$5,669,685**

Notes: Amounts are based on analysis dated September 25, 2002

Exhibit G-7: Economic Impact, Tier 1, Pennsylvania

Source Category	Tier 1 Costs		Tier 1 Spending	
	Economic Effect	Economic Impact	Economic Effect	Economic Impact
Agriculture – private	Reduce Output Cost: $5,940,400	Total Output...($10,256,658) Total Jobs.....(202.9) Value Added....($3,807,442)	Increase Output: Ag. Services $15,933,597	Total Output.....$26,787,817 Total Jobs.....781.5 Value Added.....$16,416,402
Agriculture – public	Reduce Household Consumption Cost: $3,197,823	Total Output.....($4,922,355) Total Jobs.....(62.6) Value Added....($2,931,505)		
Urban & Mixed Open	Reduce Household Consumption Cost: $10,115,328	Total Output...($15,570,353) Total Jobs.....(198) Value Added....($9,272,912)	Increase Output: Water Supply & Sewerage $10,115,328	Total Output.....$17,006,050 Total Jobs.....496.1 Value Added.....$10,421,823
POTW	Reduce Household Consumption Cost: $6,404,548	Total Output.....($9,858,412) Total Jobs.....(125.4) Value Added....($5,871,170)	Increase Output: Water Supply & Sewerage $6,404,548	Total Output.....$10,513,365 Total Jobs.....96.4 Value Added.....$6,784,707
Forest	Reduce Output Cost: $13,880,287	Total Output...($20,687,786) Total Jobs.....(256.4) Value Added....($9,174,313)	Increase Output: Ag. Services $13,880,287	Total Output.....$23,335,759 Total Jobs.....680.8 Value Added.....$14,300,874
Total	**Cost $39,538,386**	**Total Output.($61,295,564) Total Jobs.....(845.3) Value Added.($31,057,342)**	**Spending $46,333,760**	**Total Output....$77,642,991 Total Jobs.....2,054.8 Value Added....$47,923,806**

Notes: Amounts are based on analysis dated September 25, 2002

Exhibit G-8: Economic Impact, Tier 1, Virginia

Source Category	Tier 1 Costs		Tier 1 Spending	
	Economic Effect	Economic Impact	Economic Effect	Economic Impact
Urban & Mixed Open	Reduce Household Consumption Cost: $23,700,063	Total Output...($31,767,898) Total Jobs.....(318.8) Value Added..($14,706,532)	Increase Output: Water Supply & Sewerage $23,700,063	Total Output.....$37,242,783 Total Jobs.....363.1 Value Added.....$24,158,761
POTW	Reduce Household Consumption Cost: $21,297,242	Total Output...($28,547,122) Total Jobs.....(286.5) Value Added..($13,215,516)	Increase Output: Water Supply & Sewerage $25,312,510	Total Output.....$39,776,615 Total Jobs.....387.8 Value Added.....$25,802,415
Agriculture – private	Reduce Output Cost: $688,712	Total Output.....($1,109,099) Total Jobs..... (23.6) Value Added.....($452,397)	Increase Output: Ag. Services $12,435,840	Total Output.....$19,449,950 Total Jobs.....783.6 Value Added.....$11,355,644
Agriculture – public	Reduce Household Consumption Cost: $3,759,081	Total Output.....($5,038,725) Total Jobs.....(50.6) Value Added....($2,332,612)		
Forest	Reduce Output Cost: $3,019,242	Total Output.....($4,218,641) Total Jobs.....(52.4) Value Added....($1,802,385)	Increase Output: Ag. Services $3,019,242	Total Output.....$4,722,166 Total Jobs.....190.3 Value Added.....$2,756,991
Total	**Cost $52,464,340**	**Total Output.($70,681,485) Total Jobs.....(731.9) Value Added.($32,509,442)**	**Spending $64,467,655**	**Total Output..$101,191,514 Total Jobs.....1,724.8 Value Added....$64,073,831**

Notes: Amounts are based on analysis dated September 25, 2002

Exhibit G-9: Economic Impact, Tier 1, West Virginia

Source Category	Tier 1 Costs		Tier 1 Spending	
	Economic Effect	Economic Impact	Economic Effect	Economic Impact
Agriculture – private	Reduce Output Cost:$1,013,092	Total Output.....($1,410,374) Total Jobs.....(41.7) Value Added.....($342,345)	Increase Output: Ag. Services $3,613,336	Total Output.....$5,269,874 Total Jobs.....451.5 Value Added.....$1,896,470
Agriculture – public	Reduce Household Consumption Cost:$1,079,629	Total Output.....($1,079,629) Total Jobs.....(17.3) Value Added.....($609,686)		
Urban & Mixed Open	Reduce Household Consumption Cost: $866,129	Total Output.....($1,123,811) Total Jobs.....(18) Value Added.....($634,636)	Increase Output: Water Supply & Sewerage $866,129	Total Output.....$1,237,023 Total Jobs.....$16.4 Value Added.....$785,431
Forest	Reduce Output Cost: $1,328,544	Total Output.....($1,605,661) Total Jobs.....(21.9) Value Added.....($574,452)	Increase Output: Ag. Services $1,328,544	Total Output.....$1,937,617 Total Jobs.....166.0 Value Added.....$697,290
Total	**Cost $4,287,394**	**Total Output...($5,219,475) Total Jobs.....(98.9) Value Added...($2,161,119)**	**Spending $5,808,009**	**Total Output.....$8,444,514 Total Jobs.....634.5 Value Added.....$3,379,191**

Notes: Amounts are based on analysis dated September 25, 2002

Exhibit G-10: Economic Impact, Tier 2, Delaware

Source Category	Tier 2 Costs		Tier 2 Spending	
	Economic Effect	Economic Impact	Economic Effect	Economic Impact
Agriculture – private	Reduce Output $885,523	Total Output.....($1,383,648) Total Jobs .....(20.3) Value Added.....($511,394)	Increase Output: Ag. Services $5,707,159	Total Output.....$6,211,488 Total Jobs.....63.5 Value Added.....$898,564
Agriculture – public	Reduce Household Consumption $1,542,924	Total Output.....($2,142,203) Total Jobs.....(26.8) Value Added....($1,313,892)		
Urban & Mixed Open	Reduce Household Consumption $992,026	Total Output.....($1,377,334) Total Jobs.....(17.2) Value Added.....($844,769)	Increase Output: Water Supply & Sewerage $992,026	Total Output.....$1,473,361 Total Jobs.....11.6 Value Added.....$958,710
POTW	Reduce Household Consumption $567,595	Total Output.....($788052) Total Jobs.....(9.9) Value Added.....($483,341)	Increase Output: Water Supply & Sewerage $567,595	Total Output.....$842,994 Total Jobs.....6.6 Value Added.....$548,533
Forest	Reduce Output $44,020	Total Output.....($52,738) Total Jobs.....(0) Value Added.....($16,797)	Increase Output: Ag. Services $44,020	Total Output.....$65,299 Total Jobs.....2.7 Value Added.....$37,914
Total	**Cost $4,032,088**	**Total Output...($5,743,975) Total Jobs.....(74.5) Value Added...($3,170,193)**	**Spending $7,310,800**	**Total Output....$8,593,142 Total Jobs.....84.4 Value Added.....$2,443,721**

Notes: Amounts are based on analysis dated September 25, 2002

Exhibit G-11: Economic Impact, Tier 2, District of Columbia

Source Category	Tier 2 Costs		Tier 2 Spending	
	Economic Effect	Economic Impact	Economic Effect	Economic Impact
Urban & Mixed Open	Reduce Household Consumption Cost: $2,097,518	Total Output.....($2,436,030) Total Jobs.....(16.2) Value Added.....(1,057,200)	Increase Output: Water Supply & Sewerage $2,097,518	Total Output.....$3,115,242 Total Jobs.....$24.5 Value Added.....$2,027,075
POTW	Reduce Household Consumption Cost: $5,809,313	Total Output.....($6,746,862) Total Jobs.....(44.9) Value Added....($2,928,035)	Increase Output: Water Supply & Sewerage $5,809,313	Total Output.....$8,628,015 Total Jobs.....67.7 Value Added.....$5,614,213
Total	**Cost $7,906,831**	**Total Output...($9,182,892) Total Jobs.....(61.1) Value Added...($3,985,235)**	**Spending $7,906,831**	**Total Output....$11,743,257 Total Jobs.....92.2 Value Added.....$7,641,288**

Notes: Amounts are based on analysis dated September 25, 2002

Exhibit G-12: Economic Impact, Tier 2, Maryland

Source Category	Tier 2 Costs		Tier 2 Spending	
	Economic Effect	Economic Impact	Economic Effect	Economic Impact
Urban & Mixed Open	Reduce Household Consumption $47,990,949	Total Output...($65,152,649) Total Jobs.....(653.1) Value Added..($31,614,659)	Increase Output: Water Supply & Sewerage $47,990,948	Total Output.....$76,667,407 Total Jobs.....624.7 Value Added.....$50,086,196
POTW	Reduce Household Consumption $71,293,208	Total Output...($96,787,861) Total Jobs.....(970.1) Value Added..($46,965,323)	Increase Output: Water Supply & Sewerage $77,330,686	Total Output....$123,538,766 Total Jobs.....1,006.6 Value Added.....$80,706,892
Agriculture – private	Reduce Output $392,624	Total Output.....($652,109) Total Jobs.....(10.4) Value Added.....($261,898)	Increase Output: Ag. Services $36,760,376	Total Output.....$40,235,924 Total Jobs.....624.7 Value Added.....$5,799,774
Agriculture – public	Reduce Household Consumption $11,637,680	Total Output...($15,798,940) Total Jobs.....(158.4) Value Added....($7,666,275)		
Industrial	Reduce Output $1,637,472	Total Output.....($3,030,934) Total Jobs.....(15.0) Value Added.....($844,142)	Increase Output: Water Supply & Sewerage $1,657,260	Total Output.....$2,647,537 Total Jobs.....21.6 Value Added.....$1,729,615
Forest	Reduce Output $1,791,593	Total Output.....($2,530,339) Total Jobs.....(34.3) Value Added.....($974,253)	Increase Output: Ag. Services $1,791,593	Total Output.....$2,809,162 Total Jobs.....100.8 Value Added.....$1,698,054
Total	**Cost $134,743,526**	**TotalOutput($183,952,832) Total Jobs.....(1,841.3) Value Added.($88,326,550)**	**Spending**	**Total Output..$245,898,796 Total Jobs.....1,192.1 Value Added..$140,020,531**

Notes: Amounts are based on analysis dated September 25, 2002

Exhibit G-13: Economic Impact, Tier 2, New York

Source Category	Tier 2 Costs		Tier 2 Spending	
	Economic Effect	Economic Impact	Economic Effect	Economic Impact
Agriculture – private	Reduce Output Cost: $3,439,989	Total Output.....($5,510,203) Total Jobs.....(92) Value Added....($1,924,908)	Increase Output: Ag. Services $13,161,146	Total Output.....$15,767,914 Total Jobs.....215.2 Value Added.....$4,027,338
Agriculture – public	Reduce Household Consumption Cost:$3,110,770	Total Output.....($4,670,303) Total Jobs.....(59.7) Value Added....($2,781,711)		
Urban & Mixed Open	Reduce Household Consumption Cost: $6,400,430	Total Output.....($9,609,180) Total Jobs.....(122.8) Value Added....($5,723,389)	Increase Output: Water Supply & Sewerage $6,400,430	Total Output.....$10,203,954 Total Jobs.....88.3 Value Added.....$6,591,920
POTW	Reduce Household Consumption Cost: $6,332,292	Total Output.....($9,506,882) Total Jobs.....(121.5) Value Added....($5,662,459)	Increase Output: Water Supply & Sewerage $6,332,292	Total Output.....$10,095,324 Total Jobs.....87.3 Value Added.....$6,521,743
Forest	Reduce Output Cost: $4,089,798	Total Output.....($5,913,903) Total Jobs.....(87.5) Value Added....($2,177,659)	Increase Output: Ag. Services $4,089,798	Total Output.....$4,899,846 Total Jobs.....66.9 Value Added.....$1,251,487
Total	**Cost $23,373,279**	**Total Output.($26,654,277) Total Jobs.....(483.5) Value Added.($18,270,126)**	**Spending $29,983,666**	**Total Output....$40,967,038 Total Jobs.....457.7 Value Added....$18,392,488**

Notes: Amounts are based on analysis dated September 25, 2002

Exhibit G-14: Economic Impact, Tier 2, Pennsylvania

Source Category	Tier 2 Costs		Tier 2 Spending	
	Economic Effect	Economic Impact	Economic Effect	Economic Impact
Agriculture – private	Reduce Output Cost: $19,559,125	Total Output...($33,770,665) Total Jobs.....(668) Value Added..($12,356,231)	Increase Output: Ag. Services $81,938,770	Total Output....$107,307,371 Total Jobs.....1,826.5 Value Added.....$38,368,597
Agriculture – public	Reduce Household Consumption Cost: $19,961,486	Total Output...($30,726,376) Total Jobs.....(390.7) Value Added..($18,299,071)		
Urban & Mixed Open	Reduce Household Consumption Cost: $28,839,070	Total Output...($44,391,492) Total Jobs.....(564.5) Value Added..($26,437,320)	Increase Output: Water Supply & Sewerage $28,839,070	Total Output.....$44,916,351 Total Jobs.....377 Value Added.....$26,547,701
POTW	Reduce Household Consumption Cost: $32,518,325	Total Output...($50,054,905) Total Jobs.....(636.5) Value Added..($29,810,161)	Increase Output: Water Supply & Sewerage $32,518,325	Total Output.....$50,646,723 Total Jobs.....425.2 Value Added.....$29,934,625
Industrial	Reduce Output Cost: $1,982,783	Total Output.....($3,303,465) Total Jobs..... (21.3) Value Added....($1,209,462)	Increase Output: Water Supply & Sewerage $1,982,783	Total Output.....$3,088,150 Total Jobs.....25.9 Value Added.....$1,825,244
Forest	Reduce Output Cost: $15,615,323	Total Output...($23,273,759) Total Jobs.....(288.4) Value Added..($10,321,102)	Increase Output: Ag. Services $15,615,323	Total Output....$226,408,491 Total Jobs.....3,002.7 Value Added...$103,988,188
Total	**Cost $118,476,112**	**TotalOutput($185,520,662) Total Jobs.....(2,569.4) Value Added...(98,433,347)**	**Spending $160,894,271**	**Total Output..$226,408,491 Total Jobs.....3,002.7 Value Added..$103,988,188**

Notes: Amounts are based on analysis dated September 25, 2002

Exhibit G-15: Economic Impact, Tier 2, Virginia

Source Category	Tier 2 Costs		Tier 2 Spending	
	Economic Effect	Economic Impact	Economic Effect	Economic Impact
Urban & Mixed Open	Reduce Household Consumption Cost: $59,687,318	Total Output...($80,005,719) Total Jobs.....(802.9) Value Added..($37,037,599)	Increase Output: Water Supply & Sewerage $59,687,318	Total Output.....$93,793,922 Total Jobs.....914.5 Value Added.....$60,842,524
POTW	Reduce Household Consumption Cost: $69,507,751	Total Output...($93,169,165) Total Jobs.....(935) Value Added..($43,131,444)	Increase Output: Water Supply & Sewerage $81,058,660	Total Output....$127,377,293 Total Jobs.....1,242 Value Added.....$82,627,491
Agriculture – private	Reduce Output Cost: $9,535,365	Total Output...($15,355,709) Total Jobs.....(326.1) Value Added....($6,263,540)	Increase Output: Ag. Services $57,150,659	Total Output.....$67,011,708 Total Jobs.....1101.7 Value Added.....$15,964,782
Agriculture – public	Reduce Household Consumption Cost: $15,236,894	Total Output...($20,423,746) Total Jobs.....(205) Value Added....($9,454,906)		
Industrial	Reduce Output Cost: $3,954,826	Total Output.....($6,938,839) Total Jobs.....(45.6) Value Added....($1,912,800)	Increase Output: Water Supply & Sewerage $3,954,826	Total Output.....$6,214,697 Total Jobs.....60.6 Value Added.....$4,031,369
Forest	Reduce Output Cost: $4,077,351	Total Output.....($5,697,085) Total Jobs.....(70.8) Value Added....($2,434,040)	Increase Output: Ag. Services $4,077,351	Total Output.....$6,377,074 Total Jobs.....256.9 Value Added.....$3,723,193
Total	**Cost $146,762,611**	**TotalOutput($221,590,263) Total Jobs.....(2,385.4) ValueAdded($100,234,329)**	**Spending $205,928,814**	**Total Output..$300,724,694 Total Jobs.....3575.7 Value Added..$167,189,359**

Notes: Amounts are based on analysis dated September 25, 2002

Exhibit G-16: Economic Impact, Tier 2, West Virginia

Source Category	Tier 2 Costs		Tier 2 Spending	
	Economic Effect	Economic Impact	Economic Effect	Economic Impact
Agriculture – private	Reduce Output Cost: $3,808,793	Total Output.....($5,302,405) Total Jobs.....(156.8) Value Added....($1,287,070)	Increase Output: Ag. Services $11,804,039	Total Output.....$17,215,614 Total Jobs.....1,475 Value Added.....$6,195,383
Agriculture – public	Reduce Household Consumption Cost: $2,558,479	Total Output.....($3,319,651) Total Jobs.....(53.2) Value Added....($1,874,666)		
Urban & Mixed Open	Reduce Household Consumption Cost: $2,524,008	Total Output.....($3,274,925) Total Jobs.....(52.5) Value Added....($1,849,408)	Increase Output: Water Supply & Sewerage $2,524,008	Total Output.....$3,604,838 Total Jobs.....47.8 Value Added.....$2,288,844
POTW	Reduce Household Consumption Cost: $1,917,724	Total Output.....($2,488,265) Total Jobs.....(39.9) Value Added....($1,405,167)	Increase Output: Water Supply & Sewerage $1,917,724	Total Output.....$2,738,932 Total Jobs.....36.3 Value Added.....$1,739,049
Industrial	Reduce Output Cost: $546,423	Total Output.....($758,961) Total Jobs.....(5.7) Value Added.....($303,974)	Increase Output: Water Supply & Sewerage $546,423	Total Output.....$776,128 Total Jobs.....10.3 Value Added.....$492,792
Forest	Reduce Output Cost: $1,494,612	Total Output.....($1,806,368) Total Jobs.....(24.7) Value Added..($16,950,575)	Increase Output: Ag. Services $1,494,612	Total Output.....$2,179,819 Total Jobs.....186.8 Value Added.....$784,451
Total	**Cost $12,850,039**	**Total Output.($16,950,575) Total Jobs.....(332.8) Value Added...($7,366,544)**	**Spending $18,286,806**	**Total Output....$26,515,331 Total Jobs.....1,756.2 Value Added....$11,500,519**

Notes: Amounts are based on analysis dated September 25, 2002

Exhibit G-17: Economic Impact, Tier 3, Delaware

Source Category	Tier 3 Costs		Tier 3 Spending	
	Economic Effect	Economic Impact	Economic Effect	Economic Impact
Agriculture – private	Reduce Output $1,350,567	Total Output ....($2,110,289) Total Jobs.....(30.9) Value Added.....($779,959)	Increase Output: Ag. Services $8,345,864	Total Output.....$12,380,296 Total Jobs.....507.9 Value Added.....$7,188,149
Agriculture – public	Reduce Household Consumption $2,238,495	Total Output.....($3,107,937) Total Jobs.....(38.9) Value Added....($1,906,212)		
Urban & Mixed Open	Reduce Household Consumption $2,417,054	Total Output.....($3,355,899) Total Jobs.....(42.0) Value Added....($2,058,265)	Increase Output: Water Supply & Sewerage $2,417,054	Total Output.....$3,589,818 Total Jobs.....28.2 Value Added.....$2,335,879
Septic	Reduce Household Consumption $204,969	Total Output.....($284,580) Total Jobs.....(3.6) Value Added.....($174,543)	Increase Output: Residential Maintenance & Repair $204,969	Total Output.....$302,910 Total Jobs.....3.8 Value Added.....$154,311
POTW	Reduce Household Consumption $800,448	Total Output.....($1,111,346) Total Jobs.....(13.9) Value Added.....($681,629)	Increase Output: Water Supply & Sewerage $800,448	Total Output.....$1,188,829 Total Jobs.....9.3 Value Added.....$773,566
Forest	Reduce Output $73,355	Total Output.....($87,884) Total Jobs.....(0.4) Value Added.....($27,990)	Increase Output: Ag. Services $73,355	Total Output.....$108,815 Total Jobs.....4.5 Value Added.....$63,179
Total	**Cost $7,084,928**	**Total Output.($10,057,935) Total Jobs.....(129.7) Value Added...($5,628,598)**	**Spending $11,841,690**	**Total Output....$17,570,668 Total Jobs.....553.7 Value Added....$10,515,084**

Notes: Amounts are based on analysis dated September 25, 2002

Exhibit G-18: Economic Impact, Tier 3, District of Columbia

Source Category	Tier 3 Costs		Tier 3 Spending	
	Economic Effect	Economic Impact	Economic Effect	Economic Impact
Urban & Mixed Open	Reduce Household Consumption Cost: $8,353,943	Total Output.....($9,702,162) Total Jobs.....(64.5) Value Added....($4,210,590)	Increase Output: Water Supply & Sewerage $8,353,943	Total Output.....$12,407,310 Total Jobs.....$97.4 Value Added.....$8,073,384
Septic	Reduce Household Consumption Cost: $37,402	Total Output.....($43,438) Total Jobs.....(0) Value Added.....($18,852)	Increase Output: Residential Maintenance & Repair $37,402	Total Output.....$47,726 Total Jobs.....0.5 Value Added.....$24,336
POTW	Reduce Household Consumption Cost: $18,779,834	Total Output...($21,810,658) Total Jobs.....(145.1) Value Added....($9,465,493)	Increase Output: Water Supply & Sewerage $18,779,834	Total Output.....$27,891,885 Total Jobs.....219 Value Added.....$18,149,132
Total	**Cost $27,171,179**	**Total Output.($31,556,258) Total Jobs.....(209.6) Value Added.($13,694,935)**	**Spending $27,171,179**	**Total Output....$40,346,921 Total Jobs.....316.9 Value Added....$26,246,852**

Notes: Amounts are based on analysis dated September 25, 2002

Exhibit G-19: Economic Impact, Tier 3, Maryland

Source Category	Tier 3 Costs		Tier 3 Spending	
	Economic Effect	Economic Impact	Economic Effect	Economic Impact
Urban & Mixed Open	Reduce Household Consumption $121,021,912	Total Output.($164,299,692) Total Jobs.....(1,646.8) Value Added..($79,724,751)	Increase Output: Water Supply & Sewerage $121,021,912	Total Output....$193,337,212 Total Jobs .....1,575.4 Value Added...$126,305,637
POTW	Reduce Household Consumption $102,358,756	Total Output.($138,962,535) Total Jobs.....(1,392.9) Value Added..($67,430,154)	Increase Output: Water Supply & Sewerage $112,536,954	Total Output....$179,782,159 Total Jobs..... 1,464.9 Value Added...$117,450,234
Agriculture – private	Reduce Output $1,035,545	Total Output.....($1,719,937) Total Jobs.....(27.6) Value Added.....($690,755)	Increase Output: Ag. Services $52,745,277	Total Output.....$57,732,129 Total Jobs.....494.2 Value Added.....$8,321,750
Agriculture – public	Reduce Household Consumption $16,547,114	Total Output...($22,464,409) Total Jobs.....(225.2) Value Added..($10,900,626)		
Septic	Reduce Household Consumption $3,674,683	Total Output.....($4,988,760) Total Jobs.....(50.0) Value Added....($2,420,745)	Increase Output: Residential Maintenance & Repair $3,674,683	Total Output.....$6,047,763 Total Jobs.....74.5 Value Added.....$3,149,972
Industrial	Reduce Output $2,676,420	Total Output.....($4,882,955) Total Jobs.....(26) Value Added....($1,484,169)	Increase Output: Water Supply & Sewerage $2,698,833	Total Output.....$4,311,491 Total Jobs.....35.1 Value Added.....$2,816,662
Forest	Reduce Output $1,990,659	Total Output.....($2,811,366) Total Jobs.....(38.1) Value Added.....($108,504)	Increase Output: Ag. Services $1,990,659	Total Output.....$3,121,291 Total Jobs .....112.0 Value Added.....$188,6727
Total	**Cost $249,305,089**	**TotalOutput($340,129,654) Total Jobs.....(3406.6) ValueAdded($162,759,704)**	**Spending $294,668,318**	**Total Output..$444,332,045 Total Jobs.....3,756.1 Value Added..$301,600,687**

Notes: Amounts are based on analysis dated September 25, 2002

Exhibit G-20: Economic Impact, Tier 3, New York

Source Category	Tier 3 Costs		Tier 3 Spending	
	Economic Effect	Economic Impact	Economic Effect	Economic Impact
Agriculture – private	Reduce Output Cost: $7,291,419	Total Output...($11,679,456) Total Jobs.....(195.1) Value Added....($4,080,045)	Increase Output: Ag. Services $25,608,996	Total Output.....$30,681,253 Total Jobs.....418.8 Value Added.....$7,836,406
Agriculture – public	Reduce Household Consumption Cost: $5,861,625	Total Output.....($8,800,254) Total Jobs.....(112.5) Value Added.....(5,241,580)		
Urban & Mixed Open	Reduce Household Consumption Cost: $21,814,082	Total Output...($32,750,211) Total Jobs.....(418.6) Value Added....(19,506,578)	Increase Output: Water Supply & Sewerage $21,814,082	Total Output.....$34,777,333 Total Jobs.....300.8 Value Added.....$22,466,722
Septic	Reduce Household Consumption Cost: $1,279,042	Total Output.....($1,920,269) Total Jobs.....(24.5) Value Added....($1,143,744)	Increase Output: Residential Maintenance & Repair $1,279,042	Total Output.....$2,126,958 Total Jobs.....28.1 Value Added.....$1,034,325
POTW	Reduce Household Consumption Cost: $10,280,806	Total Output.....($1,534,918) Total Jobs.....(197.3) Value Added....($9,193,297)	Increase Output: Water Supply & Sewerage $10,280,806	Total Output.....$16,391,356 Total Jobs.....141.8 Value Added.....$10,590,246
Forest	Reduce Output Cost: $4,544,220	Total Output.....($6,571,359) Total Jobs.....(97.2) Value Added....($2,420,045)	Increase Output: Ag. Services $4,544,220	Total Output.....$5,444,273 Total Jobs.....74.3 Value Added.....$1,390,541
Total	**Cost $51,071,194**	**Total Output.($63,256,467) Total Jobs.....(1,044.9) Value Added.($41,585,289)**	**Spending $63,527,146**	**Total Output....$89,421,173 Total Jobs.....1,927.6 Value Added....$43,318,240**

Notes: Amounts are based on analysis dated September 25, 2002

Exhibit G-21: Economic Impact, Tier 3, Pennsylvania

Source Category	Tier 3 Costs		Tier 3 Spending	
	Economic Effect	Economic Impact	Economic Effect	Economic Impact
Agriculture – private	Reduce Output Cost: $31,692,697	Total Output...($54,720,414) Total Jobs.....(1,082.3) Value Added..($20,313,127)	Increase Output: Ag. Services $134,371,102	Total Output....$175,972,988 Total Jobs.....$2,995.2 Value Added.....$62,920,533
Agriculture – public	Reduce Household Consumption Cost: $32,857,090	Total Output...($50,576,361) Total Jobs.....(643.1) Value Added..($30,120,714)		
Urban & Mixed Open	Reduce Household Consumption Cost: $90,435,965	Total Output.($139,206,549) Total Jobs.....(1,770.1) Value Added..($82,904,357)	Increase Output: Water Supply & Sewerage $90,435,965	Total Output....$140,852,452 Total Jobs.....1,182.4 Value Added.....$83,250,503
Septic	Reduce Household Consumption Cost: $4,641,414	Total Output.....($7,144,450) Total Jobs.....(90.8) Value Added....($4,254,872)	Increase Output: Residential Maintenance & Repair $4,641,414	Total Output.....$8,292,029 Total Jobs.....105.3 Value Added.....$4,152,979
POTW	Reduce Household Consumption Cost: $60,768,959	Total Output...($93,540,628) Total Jobs.....(1,189.4) Value Added..($55,708,051)	Increase Output: Water Supply & Sewerage $60,768,959	Total Output.....$94,646,602 Total Jobs.....794.5 Value Added.....$55,940,648
Industrial	Reduce Output Cost: $4,067,001	Total Output.....($6,641,117) Total Jobs.....(57.1) Value Added....($2,651,446)	Increase Output: Water Supply & Sewerage $4,067,001	Total Output.....$6,334,284 Total Jobs.....53.2 Value Added.....$3,743,683
Forest	Reduce Output Cost: $17,350,359	Total Output...($25,859,733) Total Jobs.....(320.5) Value Added..($11,467,893)	Increase Output: Ag. Services $17,350,359	Total Output.....$22,722,108 Total Jobs.....386.8 Value Added.....$8,124,469
Total	**Cost $241,813,485**	**TotalOutput($377,689,252) Total Jobs.....(5,153.3) ValueAdded($207,420,460)**	**Spending $311,634,800**	**Total Output..$308,108,863 Total Jobs.....5,157.4 Value Added..$218,132,815**

Notes: Amounts are based on analysis dated September 25, 2002

Exhibit G-22: Economic Impact, Tier 3, Virginia

Source Category	Tier 3 Costs		Tier 3 Spending	
	Economic Effect	Economic Impact	Economic Effect	Economic Impact
Urban & Mixed Open	Reduce Household Consumption Cost: $172,647,119	Total Output.($231,418,617) Total Jobs.....(2,322.4) ValueAdded.($107,132,217)	Increase Output: Water Supply & Sewerage $172,647,119	Total Output....$271,290,984 Total Jobs.....2645.0 Value Added...$175,970,097
POTW	Reduce Household Consumption Cost: $107,042,942	Total Output.($143,481,863) Total Jobs.....(1,439.9) Value Added..($66,423,048)	Increase Output: Water Supply & Sewerage $124,761,210	Total Output.....$13,220,257 Total Jobs .....129.4 Value Added.....$8,607,615
Agriculture – private	Reduce Output Cost: $20,786,808	Total Output...($33,474,983) Total Jobs.....(711) Value Added..($13,654,328)	Increase Output: Ag. Services $103,068,209	Total Output....$120,852,099 Total Jobs.....1986.8 Value Added.....$28,791,662
Agriculture – public	Reduce Household Consumption Cost: $26,330,048	Total Output...($35,293,165) Total Jobs.....(354.5) Value Added..($16,338,508)		
Industrial	Reduce Output Cost: $8,445,071	Total Output...($14,477,606) Total Jobs.....(87.4) Value Added....($4,263,483)	Increase Output: Water Supply & Sewerage $8,445,071	Total Output.....$13,220,257 Total Jobs.....129.4 Value Added.....$8,607,615
Forest	Reduce Output Cost: $5,135,459	Total Output.....($7,175,529) Total Jobs.....(89.2) Value Added....($3,065,695)	Increase Output: Ag. Services $5,135,459	Total Output.....$6,021,556 Total Jobs..... 99 Value Added.....$1,434,569
Septic	Reduce Household Consumption Cost: $4,458,755	Total Output.....($5,976,578) Total Jobs.....(60) Value Added....($2,766,778)	Increase Output: Residential Maintenance & Repair $4,458,755	Total Output.....$7,426,401 Total Jobs.....1911.3 Value Added.....$3,662,634
Total	**Cost $344,846,202**	**TotalOutput($471,298,341) Total Jobs.....(5,064.1) ValueAdded($213,644,057)**	**Spending $418,515,823**	**Total Output..$614,856,220 Total Jobs.....6,865.3 Value Added..$345,629,090**

Notes: Amounts are based on analysis dated September 25, 2002

Exhibit G-23: Economic Impact, Tier 3, West Virginia

Source Category	Tier 3 Costs		Tier 3 Spending	
	Economic Effect	Economic Impact	Economic Effect	Economic Impact
Agriculture – private	Reduce Output Cost: $8,707,287	Total Output...($12,121,835) Total Jobs.....(358.4) Value Added....($2,942,372)	Increase Output: Ag. Services $23,575,072	Total Output.....$34,383,091 Total Jobs .....2,945.8 Value Added.....$12,373,444
Agriculture – public	Reduce Household Consumption Cost: $4,757,691	Total Output.....($6,173,150) Total Jobs.....(98.9) Value Added....($3,486,087)		
Urban & Mixed Open	Reduce Household Consumption Cost: $7,602,360	Total Output.....($9,864,136) Total Jobs.....(158.1) Value Added....($5,570,451)	Increase Output: Water Supply & Sewerage $7,602,360	Total Output.....$10,857,842 Total Jobs.....143.9 Value Added.....$6,894,042
Septic	Reduce Household Consumption Cost: $428,640	Total Output.....($556,165) Total Jobs.....(8.9) Value Added.....($314,076)	Increase Output: Residential Maintenance & Repair $428,640	Total Output.....$638,537 Total Jobs.....9.7 Value Added.....$272,067
POTW	Reduce Household Consumption Cost: $2,709,448	Total Output.....($3,515,535) Total Jobs.....(56.3) Value Added....($1,985,285)	Increase Output: Water Supply & Sewerage $2,709,448	Total Output.....$3,869,688 Total Jobs.....51.3 Value Added.....$2,457,007
Industrial	Reduce Output Cost: $597,259	Total Output.....($829,570) Total Jobs.....(6.2) Value Added.....($332,254)	Increase Output: Water Supply & Sewerage $597,259	Total Output.....$853,017 Total Jobs.....11.3 Value Added.....$871,612
Forest	Reduce Output Cost:$1,660,679	Total Output.....($2,007,075) Total Jobs.....(27.4) Value Added.....($718,065)	Increase Output: Ag. Services $1,660,679	Total Output.....$2,422,019 Total Jobs.....207.5 Value Added.....$871,612
Total	**Cost $26,463,364**	**Total Output.($35,067,466) Total Jobs.....(714.2) Value Added.($15,348,590)**	**Spending $36,573,458**	**Total Output....$53,024,194 Total Jobs.....3,369.5 Value Added....$23,409,784**

Notes: Amounts are based on analysis dated September 25, 2002